



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,796	12/04/2003	Chris Boyer	LYNN/0177	8892
24945 7590 01/12/2007 STREETS & STEELE 13831 NORTHWEST FREEWAY SUITE 355 HOUSTON, TX 77040			EXAMINER THOMPSON, MELISSA	
			ART UNIT	PAPER NUMBER
			1745	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/12/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/727,796

Applicant(s)

BOYER ET AL.

Examiner

Melissa B. Thompson

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 12-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/10/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-11 are drawn to a method of securing a sub-stack, classified in class 429, subclass 12.
 - II. Claims 12-19 are drawn to an electrochemical sub-stack, classified in class 429, subclass 32.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the electrochemical sub-stack could be made using a different process, such as using a different method to secure the sub-stacks together, instead of banding them, the sub-stacks could be secured using adhesive.
3. This application contains claims directed to the following patentably distinct species: fuel cell, electrolyzer, or oxygen concentrator. The species are independent or distinct because they each operate in a different manner and have different design, function, and effect.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently claim 1, "a method, comprising: securing a first

plurality of electrochemical cell components into a first functioning sub-stack and a second plurality of electrochemical cell components into a second functioning sub-stack, the first and second functioning sub-stacks each having ends terminating in a structural component selected from a bipolar plate, a cooling fluid flowfield, and combinations thereof, and then securing the first and second sub-stacks together" is generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

4. This application contains claims directed to the following patentably distinct species: proton exchange membrane, alkaline electrolyte, and solid oxide electrolyte. The species are independent or distinct because they are different in both chemical and physical structure and are not obvious variants of each other.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently claim 8, "the method of claim 1, wherein the first

and second functioning sub-stacks are configured as an electrochemical device selected from a fuel cell, electrolyzer, oxygen concentrator, and combinations thereof" is generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

5. This application contains claims directed to the following patentably distinct species: wire, string, rubber bands, rope, clamps, and combinations thereof. The species are independent or distinct because they are a varied means of securing the sub-stack.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently claim 16, "the sub-stack of claim 12, further comprising: means for the securing the perimeter tabs of one end component with the

perimeter tabs of the second end component, wherein securing the tabs holds the components securely together in the order and alignment” is generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

6. This application contains claims directed to the following patentably distinct species: color, shape, design, marking, thickness, and combinations thereof. The species are independent or distinct because they are varied design parameters.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently claim 12, “an electrochemical sub-stack, comprising: electrochemical cell components assembled in a given order and alignment as required to form a functional sub-stack; and two or more perimeter tabs extending from the components located at each end of the sub-stack, wherein the two or more perimeter tabs are aligned to establish alignment of the components” is generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species.

MPEP § 809.02(a).

7. During a telephone conversation with Jeffrey Streets on Friday, December 15, 2006 a provisional election was made with traverse to prosecute the invention of a method of securing a sub-stack, claims 1-11 and elected a fuel cell as the electrochemical device and a proton exchange membrane as the medium. Affirmation of this election must be made by applicant in replying to this Office action. Claims 12-19 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

8. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

9. Claims 1,3,8,10, and 11 are objected to because of the following informalities: improper Markush language. The phrase "selected from the group consisting of " is not included in the claims and must be for proper Markush language. Appropriate correction is required.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-3, 6, 8, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kumeta et al. (U.S. Patent Number 4,615,107).

Kumeta et al. disclose a method for assembling a fuel cell stack comprising the steps of alternately stacking the number of fuel cells and bipolar plates to form a plurality of sub-stacks (abstract). Kumeta et al. disclose that the fuel cell stack comprises a plurality of fuel cells, a plurality of bipolar plates, cooling plates arranged every several fuel cells, and means for tying up, or securing, the fuel cell stack (column 2, lines 44-50). Kumeta et al. disclose a first and second stack secured together as seen in Figure 3. Kumeta et al. disclose testing each of the sub-stacks to examine its assemblage and see if its suitable or not (column 3, lines 2-5). Kumeta et al. disclose using a pair of crossed tie bars and tie rods (column 2, line 51) that include holes for securing, which are

considered perimeter tabs of a first and second component of the sub stack. The sub-stack is tied up, or banded, using these tie bars and tie rods as seen in Figure 1, securing the sub-stack together. It is inherent that the because each of these sub-stacks is making up a fuel cell, that they contain membrane electrode assemblies and include an ionically conducting medium.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumeta et al. (U.S. Patent Number 4,615,107) in view of Mease (U.S. Patent Number 6,358,641 B1).

The disclosure of Kumeta et al. as applied to claim 2 discussed above are incorporated herein. With respect to claim 7, Kumeta et al. disclose using a pair of crossed tie bars and tie rods (column 2, line 51), that include holes for securing, which are considered perimeter tabs of a first and second component of the sub stack. The sub-stack is tied up, or banded, using these tie bars and tie rods as seen in Figure 1, securing the sub-stack together. Kumeta et al. do not disclose leak-testing the sub-stack.

Mease teaches that each plate module may be leakage tested (column 2, line 67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a leakage test to the series of tests already done in the sub-stack of Kumeta et al. to ensure that the sub-stack would function properly before assemblage to the final stack.

14. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumeta et al. (U.S. Patent Number 4,615,107) in view of Ernst et al. (U.S. Patent Number 5,945,232).

The disclosure of Kumeta et al. as applied to claims 8 and 9 discussed above are incorporated herein. Kumeta et al. do not disclose that the fuel cell uses a solid medium, such as a proton exchange membrane (PEM).

Ernst et al. teach a PEM fuel cell stack that has multiple layers between a first end plate and a second end plate. The multiple layers define multiple fuel cell sub-stacks disposed in parallel (abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use a proton exchange membrane (PEM) as the solid medium for the fuel cell of Kumeta because using a PEM fuel cells offer many advantages over the conventional means of generating electrical energy. For example: they operate at relatively low temperatures and therefore require little or no warmup time; they are clean (their exhaust is typically water and air); they are efficient;

and the typical sources of fuel/oxidant (hydrogen, air/oxygen) are in abundant supply (column 1, lines 30-37).

15. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kumeta et al. (U.S. Patent Number 4,615,107) in view of Raiser et al. (U.S. Publication Number 2002/0192521 A1).

The disclosure of Kumeta et al. as applied to claim 2 discussed above are incorporated herein. Kumeta et al. do not disclose testing the sub-stack to measure electrical resistance.

Raiser et al. disclose a fuel cell stack that makes it possible to relate changes in resistance to changes in the quality of electrical isolation and to analyze the reasons for the change in electrical resistance (paragraph 16).

Raiser et al. disclose several reasons for a change in resistance and why testing for it is crucial (paragraphs 17-19). For example, a gradual change in resistance can be associated with a gradual deterioration of the coolant (paragraph 17).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a leakage test to the series of tests already done in the sub-stack of Kumeta et al. to ensure that the sub-stack would function properly before assemblage to the final stack.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa B. Thompson whose telephone number is (571)


Art Unit: 1745

272-2758. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Trainer, Susy Tsang-Foster can be reached on (571) 272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MBT


SUSY TSANG-FOSTER
PRIMARY EXAMINER